Chapter Two

An Overview of the Commercial Shrimp Harvesting Industry in the Gulf of Mexico and South Atlantic Region

2.1 Introduction

The warm-water shrimp harvesting industry in the Gulf of Mexico and South Atlantic (GSA) region represents the most economically important component of all of the domestic commercial seafood harvesting sectors in the United States. The volume and dockside value (i.e., payment received by the vessel) of commercial shrimp landings in the GSA region for all shrimp species was estimated to be 280 million pounds (whole weight) and $546 million dockside during 2001 (U.S. Dept. of Commerce, 2002). On a dockside value basis, this represents 96% of the total shrimp dockside value in the U.S., and exceeds the total dockside value for all species of crabs ($381 million) and wild caught salmon ($208 million), the two other most important species groups. The shrimp harvest sector is reportedly comprised of over 20,000 vessels and craft that actively target shrimp in near-shore and offshore waters with trawls and other gear in the GSA region (Gulf of Mexico Fishery Management Council, 1994; Swingle, 2001; South Atlantic Fishery Management Council, 1999). Less than half of these vessels operate in offshore waters, while the remainder operate in near-shore bays and estuaries.

The shrimp industry contributes to local coastal economies on several levels. Shrimp are offloaded by shore-side handling facilities, which then set in motion a myriad of economic activities associated with processing, packing, wholesale distribution, and consumer expenditures. Vessel maintenance, repair, refueling, and other activities also contribute to the overall economic activities associated with the industry. Previous studies have suggested that the commercial shrimp industry plays an important role in the economy of the GSA region. Centaur Associates (1984) found that the shrimp industry within the GSA region created 73,000 jobs, generated approximately $1 billion in income, and created $1.4 billion in added value for the U.S. economy. A more recent study estimates that the commercial shrimp industry in Florida alone creates $130 million in economic impact to the state's economy (Adams, 2003). Thus, the commercial shrimp industry is an important natural resource-based contributor to the economy of the nation and the GSA region, and provides an important source of employment and income to the coastal communities in which the vessels homeport, provision, and offload.

The shrimp industry in the GSA region has been subjected to several changes in the overall domestic market for shrimp in the U.S., as well as an evolving cost structure confronting vessels. These changes have recently created financial difficulties for individual vessel operators and fleet owners. The situation confronting vessel operators is a classic cost/price squeeze, in which market prices are falling at the same time that operating costs are increasing. This results in a situation where trip operating costs may exceed the anticipated returns for a trip. When this happens, vessel owners cannot afford

to invest in trip expenses, and vessels stay tied to the dock. This situation is reportedly being played out within the shrimp fleet in many areas of the GSA region.

Foremost in this evolving business environment for vessel operators has been the increasing dependence of the U.S. market for imported shrimp. The quantity of shrimp imported into the U.S. market has increased dramatically in recent years, placing strong downward pressure on the price of shrimp received at the dock by vessels. The surge in imports is a result of an ever-increasing domestic demand for shrimp products in the U.S., as well as changes in the demand for shrimp in the EU and the world market in general. A recession in many Asian markets and changing tariff structures in the EU with respect to certain Southeast Asian countries have directed even more foreign shrimp into the U.S. market. As a result of these increased supplies of shrimp, prices of heads-on shrimp at the docks are reportedly at historically low levels throughout the GSA region.

At the same time, fuel prices have increased dramatically due to crude oil shortages and other recent events in the Middle East. Other costs, such as insurance premiums for commercial vessels, have also increased, further cutting away at a dwindling vessel profit margin. In addition, changes in vessel operation dictated by fishery management plan revisions and environmental concerns associated with bycatch have imposed additional costs on vessel operation. For example, requiring shrimp vessels to utilize turtle excluder devices and finfish bycatch reduction devices has imposed additional investment and operating costs on vessels. And given that shrimp vessels are typically price takers, there is little if any role for vessel operators to pass these imposed costs on to wholesale purchasers and other consumers of their product.

The resulting cost/price squeeze has reportedly created significant financial hardship within the commercial shrimp fleet in the GSA region. Thus, with increasing import volumes, decreasing dockside prices, and increasing operational costs, industry leaders are once again developing strategies for gaining relief either indirectly through import barriers or direct subsidization from the U.S. Department of Commerce.

The following discussion will serve as an overview of the commercial shrimp landings component of the industry in the GSA region. Information on total shrimp landings (i.e., summarized across gear types and size classes) will be provided for both regions. Trends in annual volumes landed, dockside value, and average dockside price (nominal and real) will be provided. Landings volumes are given in whole weight units. In addition, a brief synopsis of management actions directed toward the commercial shrimp industries in both regions will be presented. Finally, some comments will be made regarding pertinent issues concerning the domestic shrimp harvesting sector, given the recent changes in the share of the domestic market associated with imported shrimp products and changing vessel costs. These developments have served as the impetus for efforts to provide economic relief to the shrimp harvesting sector. This overview will serve to provide information that will hopefully allow for a more focused discussion on the recent changes in the GSA region shrimp harvesting industry.

2.2 U.S. Shrimp Supply and Regional Shares

The total U.S. supply of shrimp in the domestic market has increased dramatically over the past 20 years. And the source of shrimp that comprises the total supply has evolved as well. Prior to 1979, domestic landings accounted for more than half of the total U.S. supply. During 1978, domestic landings represented 52% of total supply (257 million pounds). Each year since then, imported shrimp have exceeded U.S. landings and have exhibited a rapidly increasing share of the total market, particularly since 1996 (U.S. Department of Commerce, National Marine Fisheries Service, 2002). Shrimp imports increased from 240 million pounds during 1978 (48% of total supply) to 721 million pounds during 1996 (79% of the total supply) (Figure 2-1). During this period, imported shrimp products increased at an average annual rate of 6.7%, while domestic landings remained relatively stable. However, this annual percentage increase has risen considerably since 1996. Import volumes increased from 811 million pounds in 1997 to 1.2 billion pounds during 2001. During this five-year period, shrimp imports increased at an average annual rate of 10.4%, while domestic landings again remained relatively stable at approximately 200 million pounds. The share of total domestic shrimp supply represented by imports increased from 48% in 1978 to 85% in 2001. Imported product now dominates the market.

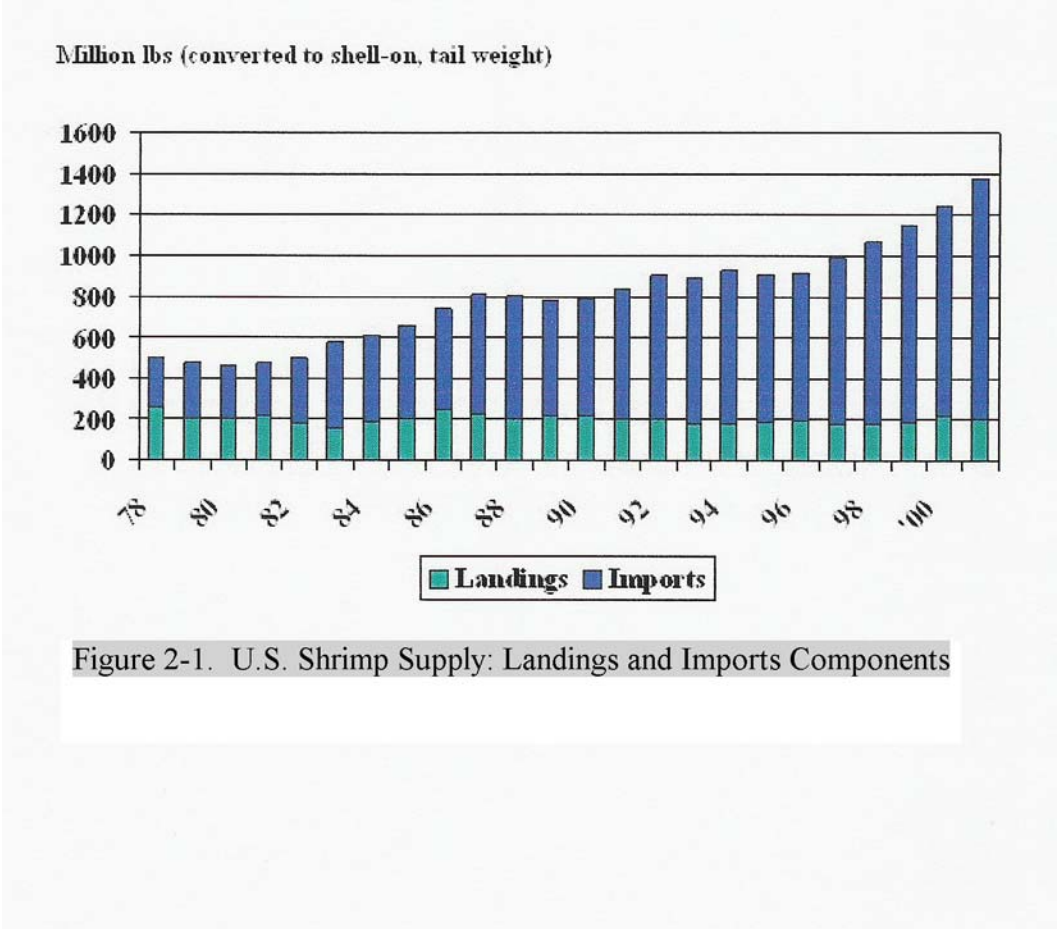

Figure 2-1. U.S. Shrimp Supply: Landings and Imports Components

The market for shrimp products is global. And as the technology of culturing shrimp has become standardized, a shift has occurred in the relative importance of shrimp exporting countries. Twenty years ago, the predominant regions of the globe that exported shrimp to the U.S. were Mexico, Central America, and northern South America. Trawling was still the most important method of producing shrimp. The most important world region in terms of exporting shrimp to the U.S. market is now Asia and Indonesia (Table 2-1). Five of the top ten countries that exported shrimp to the U.S. in 2001 are located in this global area. The combined exports associated with these five countries accounted for almost two-thirds of the total shrimp exported to the U.S. The leading country of origin for imported shrimp products during 2001 was Thailand (300 million lbs), followed by Vietnam (73 millions lbs), India (72 million lbs), Mexico (66 million lbs), China (62 million lbs), and Ecuador (59 million lbs). These regions export warm-water shrimp to the U.S. And for these Asian countries, the majority of the exported shrimp is cultured in saltwater pond systems, not trawled or otherwise wild-caught.

Table 2-1. Major Countries of Origin for the U.S. Shrimp Market, 2001

Country	Volume (million lbs)
Thailand	299.9
Viet Nam	73.3
India	72.5
Mexico	66.2
China	61.8
Ecuador	58.9
Indonesia	34.9
Guyana	25.8
Brazil	21.6
Honduras	21.3

Source: U.S. Department of Commerce, National Marine Fisheries Service. "Fisheries of the United States, 2001."

2.3 U.S. and Regional Shrimp Landings

Domestic U.S. landings of shrimp vary from year to year. Most of this variability is linked to the water quality conditions found in the coastal bays and estuaries where juvenile shrimp spend a major portion of their life cycle. U.S. shrimp landings are comprised of cold and warm-water shrimp. Cold-water shrimp are landed primarily off the northwest and northeast coasts of the U.S. and usually account for less than 20% of the total annual landings of all shrimp in the U.S. However, the majority of domestic landings are warm-water shrimp, which are landed primarily in the GSA region. The primary species landed in the GSA region include pink shrimp *(Farfantepenaeus duorarum),* white shrimp *(Litopenaeus setiferus),* and brown shrimp *(F. aztecus).* Smaller quantities of other species are landed, including rock shrimp *(Sicyonia brevirostris),* royal reds *(Pleoticus robustus),* and seabobs *(Xiphopeneus kroyeri).*

Landings of all shrimp species in the GSA exhibited a declining trend from 327 million pounds in 1986 to 232 million pounds in 1997 (Figure 2-2). However, shrimp landings increased to 279 million pounds by 2001. The average annual production during the 20-year period from 1982-2001 was 262 million pounds, of which each year on average the Gulf of Mexico accounted for 90% and the South Atlantic accounted for 10% of the total landings. Shrimp landings in the GSA represent less than 10% by volume of the total world landings of shrimp, but represent over 86% of the total U.S. shrimp landings of both warm- and cold-water species.

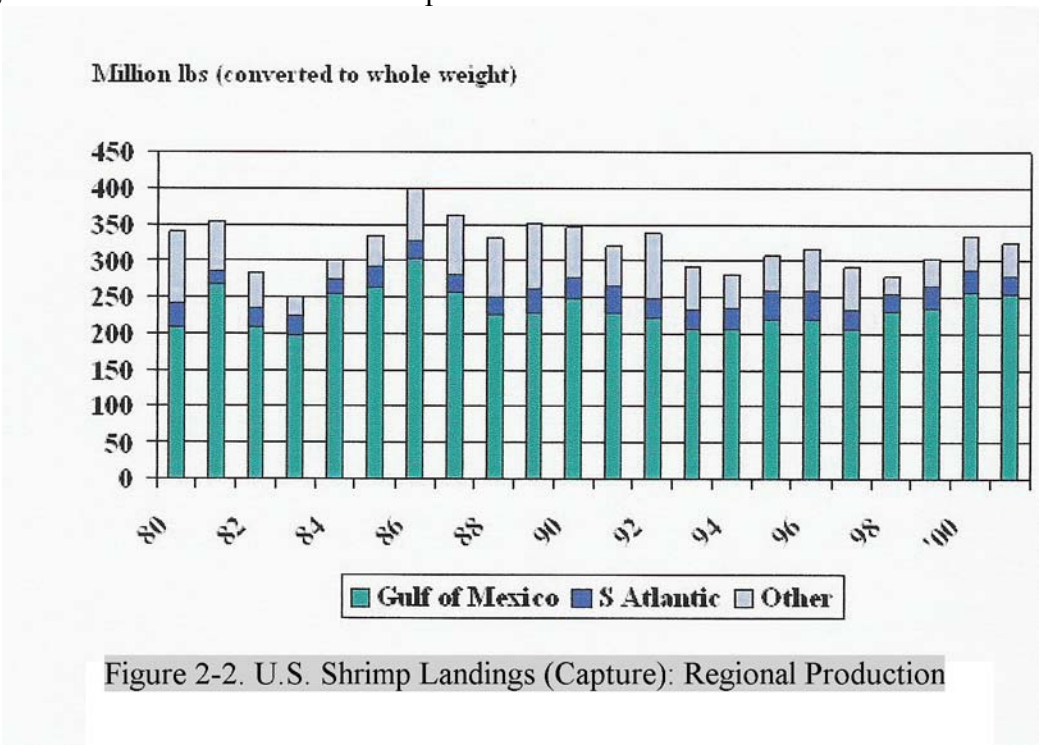

Figure 2-2. U.S. Shrimp Landings (Capture): Regional Production

The following discussion will focus on commercial landings of indigenous white, pink, and brown shrimp, which represent the majority of the landings volumes in the GSA region. For example, total landings of these three species were reported to be 258.1 million pounds during 2001, which represent 92% of the total domestic shrimp landings in the GSA region. In addition, these three species may serve as the closest substitutes for the main cultured and imported non-indigenous species, which include the black tiger shrimp *(Penaeus monodon),* the Pacific white shrimps *(P. vannamei* and *P. schmitti),* and the Pacific blue shrimp *(P. stylirostris).* Thus, a focused discussion of the landings, dockside value, prices, and markets for these three key indigenous species within the GSA region would seem an appropriate basis of discussion with respect to a domestic market being dominated by imports that serve as close substitutes.

2.3.1 Gulf of Mexico Landings

Landings (whole weight, all size classes) of brown, white, and pink shrimp in the Gulf of Mexico region (i.e., Texas through the Florida west coast) totaled 240.5 million pounds during 2001 (Table 2-2). The average landings volume during the 1982-2001 period was 226 million pounds. Total landings peaked at 286.5 million pounds during 1986, then declined to 185.1 million pounds during 1993.

Table 2-2. Shrimp Landings[1] in the Gulf of Mexico and South Atlantic Regions

Year	Gulf of Mexico	South Atlantic	Total
	million pounds		
82	202.8	21.2	224.0
83	192.3	21.8	214.1
84	248.5	12.7	261.2
85	256.6	25.6	282.2
86	286.6	22.1	308.7
87	247.4	18.9	266.3
88	215.2	22.2	237.3
89	222.8	26.4	249.1
90	248.5	21.8	270.3
91	223.7	32.1	255.7
92	195.7	22.5	218.2
93	185.1	25.3	210.4
94	195.1	16.0	211.2
95	222.8	26.7	249.4
96	205.7	15.4	221.2
97	187.4	16.8	204.2
98	239.7	16.9	256.6
99	228.6	25.2	253.8
00	275.8	24.6	300.4
01	240.5	17.7	258.1

[1] Landings are for all species and all size classes on a whole weight basis.
Source: U.S. Department of Commerce, National Marine Fisheries Service website http://www.st.nmfs.gov/st1/ commercial landings data. Data downloaded 10 June 03.

During the 20-year period, on average, brown shrimp represented 58% of the landings, with white and pink shrimp comprising 34% and 8% of the landings, respectively. Average annual landings for brown, white, and pink shrimp were 132.5, 75.7, and 17.8 million pounds, respectively. Brown and white shrimp exhibited similar trends, peaking in 1986, then declining erratically until peaking again in 2000. Pink shrimp landings peaked in 1985, fell dramatically until reaching a low in 1992, increased again to a peak in 1996, then exhibited a general decreasing trend through 2001.

Of the brown, pink, and white shrimp landings volume during 2001, Louisiana accounted for 49% of the total, or 117 million pounds (Table 2-3). Texas accounted for 32%, while Alabama, Mississippi, and the Florida west coast each accounted for approximately 6%. Of the total landed in Louisiana, 54% were brown shrimp and approximately 46% were white shrimp. Alabama and Mississippi landings were dominated by brown shrimp (75% and 77%, respectively), while Texas landings were composed primarily of brown (71% and 29%). Pink shrimp accounted for 90% of the Florida west coast landings.

Table 2-3: Landings[1] of Shrimp in the Gulf of Mexico and South Atlantic Regions by Major Species in 2001

Region / State	Species of Shrimp			Total	% of Total
	Brown	Pink	White		
	million lbs				
Gulf					
Alabama	11.5	1.1	2.6	15.2	6.3
Florida west coast	1.1	13.6	0.4	15.0	6.3
Louisiana	63.3	< 0.1	53.6	117.0	48.6
Mississippi	12.2	0.1	3.5	15.9	6.6
Texas	54.9	0.3	22.2	77.3	32.2
South Atlantic					
Florida east coast	1.2	0.4	2.4	4.1	23.0
Georgia	1.4	<0.1	2.7	4.2	23.6
North Carolina	3.9	0.2	0.9	5.0	28.3
South Carolina	2.3	<0.1	2.1	4.4	25.0

[1] Landings are reported on a whole weight across all size classes. Totals may not add due to rounding errors.
Source: U.S. Department of Commerce, National Marine Fisheries Service website http://www.st.nmfs.gov/st1/ commercial landings data. Data downloaded 10 June 03.

2.3.2 South Atlantic Landings

Landings in the south Atlantic region (i.e., Florida east coast through North Carolina) of brown, pink, and white shrimp totaled 17,651 pounds during 2001, somewhat below the average of 21,585 pounds during the 1982-2001 period (Table 2-2). Landings peaked at 32.1 million pounds during 1991. The minimum reported landings total was 15.4 million pounds during 1996. Annual landings prior to 1991 averaged 21.4 million pounds, while annual landings after 1991 averaged 20.7 million pounds.

On average, white shrimp accounted for 60% of the total annual landings in the region, while brown and pink shrimp accounted for 33% and 7% of the total landings, respectively. White shrimp landings have been somewhat erratic, with a peak in landings achieved in 1995 (22.3 million pounds), and a 16-year minimum reported in 2001 (8.1 million pounds). White shrimp landings averaged 12.9 million pounds during the 1982-2001 period. Brown shrimp landings have also been somewhat erratic during the same 20-year period, with peak landings occurring in 1985. Brown shrimp landings fell from the 1985 peak of 16.3 million pounds to 2.9 million pounds in 1987. Landings then increased to 10.8 million pounds in 1991, then declined to 2.3 million pounds in 1998. Brown shrimp landings averaged 7.1 million pounds during the 1982-2001 period. Pink shrimp landings have trended downward since achieving a peak (3.4 million pounds) in 1989. Landings decreased from 1.6 million pounds in 1993 to 0.3 million pounds in 1994, and remained below 1 million pounds during the 1994-2001 period.

Of the total brown, pink, and white shrimp landings volume during 2001, the four states in the region accounted for almost equal shares (Table 2-3). North Carolina accounted for 28%, South Carolina accounted for 25%, while Georgia and the Florida east coast each accounted for approximately 23%. Of the total landed in North Carolina, 78% were brown shrimp and approximately 17% were white shrimp. South Carolina landings were comprised of 53% brown shrimp and 47% white shrimp. In contrast, white shrimp represented the major share of landings for the Florida east coast (58%) and Georgia (66%).

2.3.3 Domestic Shrimp Aquaculture

Shrimp is cultured in the U.S., although in relatively small quantities. Shrimp culture facilities exist in the GSA region, primarily in Texas, South Carolina, and Florida. However, facilities also exist in Alabama and Georgia. These operations produce small amounts of shrimp, mostly as a heads-on product for local markets. Total U.S. shrimp aquaculture production was estimated to be approximately 5 million pounds in 2001 (U.S. Department of Commerce, 2002). In an attempt to enhance the economic viability of shrimp culture in the U.S., technology has recently been developed to allow the culture of marine shrimp in freshwater or low salinity systems (McMahon, et al., 2001). Prototype systems are currently being developed in Florida and Alabama. The successful application of this technology will allow the culture of marine shrimp in inland systems,

removed from the high cost, environmentally sensitive coastal setting that has hindered the expansion of commercial shrimp culture in the U.S.

2.3.4 Global Economy and Trade-related Issues

Other global economy and trade-related issues have possibly had an impact on the volume of shrimp entering the U.S. market. Each of these issues may have served to further increase the volume of shrimp entering the U.S. market from foreign sources, thereby placing additional downward pressure on the dockside price for shrimp in the GSA region.

First, the relative economic conditions in the three primary shrimp importing regions (i.e., U.S., Japan, and the EU) have led to a greater apparent rate of growth of imports into the U.S. than the other two regions. Vondruska (2003) suggests that factors such as differing exchange rates, unemployment, and economic growth rates among the three key regions has led to a greater relative rate of shrimp import growth in the U.S.

Second, a changing tariff structure during 1999 confronting Thai shrimp imports into the EU may have resulted in shrimp being redirected to the U.S. market over the last few years. The EU decided to no longer allow Thailand to benefit from the EU Generalized System of Preferences (GSP), whereby developing countries with weak economies are given preferential treatment regarding import tariffs. Given that Thailand (previously considered a developing country) is now the leading shrimp exporter, these reduced tariffs have been repealed. Under the EU's GSP, raw and cooked shrimp imported into the EU were subjected to a 4.5% and 6% tariff, respectively. Following repeal of the GSP benefits, raw and cooked shrimp imported into the EU will be subject to a 14.5% and 20% tariff, respectively. Since the U.S. allows the duty-free importation of shrimp products, redirection of shrimp from the EU into the U.S. is likely.

Third, in early 2002, following the detection of the banned substances chlorampenicol and nitrofuran in shrimp imported from Thailand, the EU adopted a zero tolerance program for the detection of these substances. EU detection methods allowed a detection level of 0.1 ppb, while U.S. methods provided a detection level of 5.0 ppb. These U.S. detection levels have since been revised to 1.0 ppb (and possibly will reach 0.3 ppb in the future). However, the differing detection levels, and the resulting zero tolerance policy for contaminated Thai shrimp entering the EU market, provided a window of opportunity for Thai shrimp rejected by the EU to be redirected to the U.S. market. As with the other two trade-related issues mentioned above, food safety concerns regarding these two banned substances provided an opportunity for an additional, unanticipated surge of shrimp to enter the U.S. market. Any additional supplies entering the U.S. market would have placed further downward pressure on domestic shrimp prices.

2.4 Regional Dockside Value

The annual dockside value reported by the commercial shrimp industry in the GSA region is a function of a number of factors, including the landings volumes, market price, and species composition of the landings. These factors can vary considerably from year to year. The total dockside value for shrimp landings in the GSA region was estimated to be $520.5 million in 2001. Of this total, the Gulf of Mexico contributed 92%. The following discussion will examine the trends in nominal (not adjusted for inflation), reported dockside value for the GSA region. The contribution by the major shrimp species to annual dockside value will also be addressed.

2.4.1 Gulf of Mexico Region

The total nominal dockside value of brown, pink, and white shrimp landed in the Gulf of Mexico region during 2001 was $479.5 million (Table 2-4). The Gulf of Mexico region accounted for 92% of the total dockside value attributed to shrimp landings in the overall GSA region. This was a decline from the peak of $640.4 million during the 1982-2001 period. Annual dockside value averaged $439.4 million during this period. A minimum value of $328.9 million occurred during 1993.

Approximately the same percentage distribution across species applies as with landings. During the 1982-2001 period, for example, on average brown shrimp accounted for 55% of the total dockside value, while pink and white shrimp accounted for 9% and 36%, respectively. And, the annual trend for each species roughly mirrors the respective annual trend seen for landings. The average annual dockside value for brown shrimp during the 1982-2001 period was $242.2 million. The average annual dockside value for pink and white shrimp was $38.9 million and $158.3 million, respectively.

2.4.2 South Atlantic Region

The total nominal dockside value for brown, pink, and white shrimp landed in the South Atlantic region during 2001 was $41.1 million (Table 2-4). This represented a decline from the two previous years during which the peak dockside value for the 1982-2001 period occurred (i.e., $65.3 million in 1999 and $68.3 million in 2000). Although the average dockside value during the 20-year period was $52.1 million, the lowest dockside values occurred during 1984 ($29.3 million) and 1996 ($39.3 million). The South Atlantic region accounted for 8% of the total dockside value attributed to shrimp landings in the GSA region.

Similar to the Gulf of Mexico region, approximately the same percentage distribution across species for dockside value applies as with landings. During the 1982-2001 period, on average, white shrimp accounted for 65% of the total dockside value, while brown and pink shrimp accounted for 28% and 6%, respectively. The average annual dockside value for white shrimp during the 1982-2001 period was $34.1 million. The average annual dockside value for brown and pink shrimp was $15 million and $2.9 million, respectively.

Table 2-4. Dockside Value of Commercial Shrimp Landings[1] in the Gulf of Mexico and South Atlantic Regions			
Year	Gulf of Mexico	South Atlantic	Total
	---------- million dollars ----------		
82	421.1	59.2	480.3
83	411.9	59.4	471.3
84	427.0	29.3	456.3
85	402.5	52.3	454.8
86	557.1	59.9	617.0
87	469.6	42.9	521.6
88	403.1	52.8	455.9
89	380.5	51.4	432.0
90	408.3	50.9	459.2
91	419.7	64.4	484.0
92	369.2	49.6	418.9
93	328.9	53.8	382.7
94	450.3	44.5	494.8
95	456.6	61.8	518.4
96	399.9	39.3	439.2
97	437.7	49.6	487.4
98	461.1	45.1	506.2
99	463.9	65.3	529.2
00	640.4	68.3	708.7
01	479.5	41.1	520.5

[1] Dockside values are for all species and all size classes on a whole weight basis.
Source: U.S. Department of Commerce, National Marine Fisheries Service website http://www.st.nmfs.gov/st1/ commercial landings data. Data downloaded 10 June 03.

2.5 Price Trends

Nominal, average dockside prices aggregated across species, size classes, and states on an annual basis were lower for the Gulf of Mexico than for the South Atlantic region. One comparative proxy would be the 20-year average for each region. The nominal proxy price for the Gulf of Mexico was $1.94 per pound, whole weight. The same value for the South Atlantic was $2.33 per pound. The lower price in the Gulf of Mexico region can be explained by that region's greater dependence on relatively lower valued brown shrimp. The 20-year average nominal price for Gulf of Mexico brown shrimp, which accounted for 58% of the Gulf of Mexico landings, was $2.11 per pound, whole weight. White shrimp had a 20-year average nominal price ($2.09) even lower than that of brown shrimp, and represented 34% of the total landings in the Gulf of Mexico. A similar price for pink shrimp was higher ($2.19), but pink shrimp represented only 8% of the landings for the 20-year period.

The higher proxy price for the South Atlantic region can be explained by a higher contribution to total landings by white shrimp, which had a 20-year, nominal, average price of $2.65 per pound, whole weight. This price was 27% higher than the price for white shrimp in the Gulf of Mexico region. Also, in contrast to the Gulf of Mexico region, the proxy price for pink shrimp ($1.85) was lower than that of brown shrimp ($2.11). However, pink shrimp only accounted for 7% of the landings over the 20-year period, while brown shrimp accounted for 33% of the landings.

Nominal prices in each region have exhibited a somewhat constant, if not annually erratic, trend during the 1982-2001 period (Figure 2-3). Average prices for Gulf of Mexico shrimp have generally trended below those same prices in the South Atlantic region, though this generalization doesn't hold true across individual species (i.e., Gulf of Mexico pink shrimp prices have exceeded pink shrimp prices in the South Atlantic region). The average nominal price for the Gulf of Mexico region was $2.08 in 1982. It exhibited a generally declining trend through 1990, then increased to $2.32 in 2000, only to decline again to $1.99 in 2001. The price trend for the South Atlantic region is somewhat similar to that of the Gulf of Mexico. The average nominal price for the South Atlantic region was $2.80 in 1982; it declined in general through 1993, then increased generally through 2000, only to decline to $2.33 in 2001.

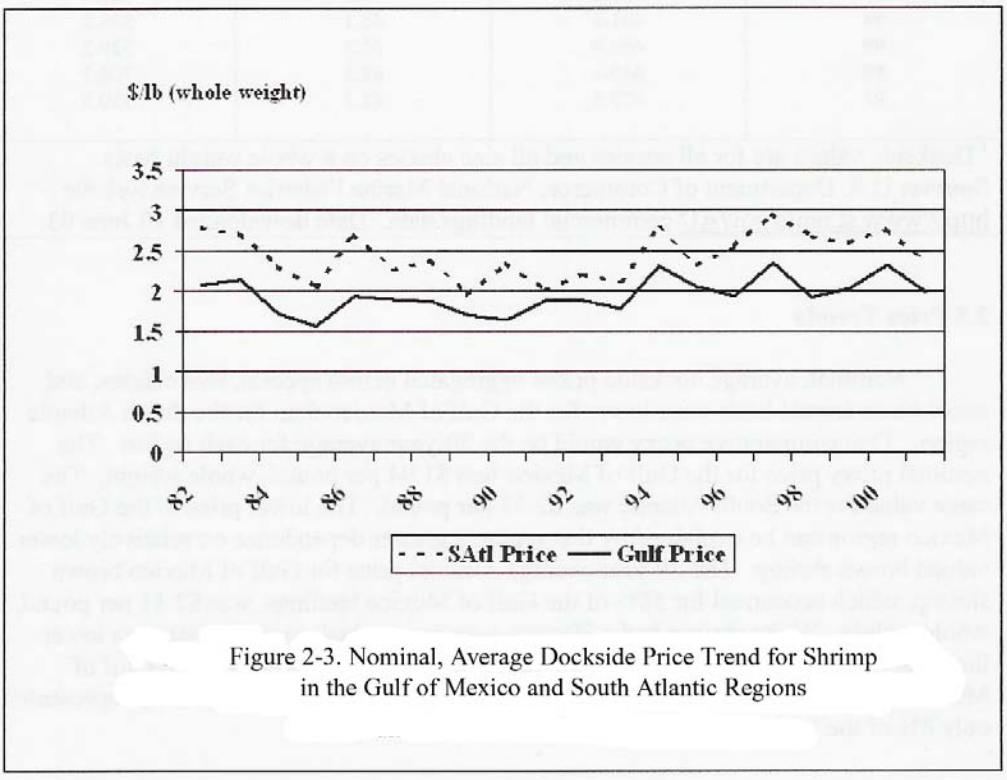

Figure 2-3. Nominal, Average Dockside Price Trend for Shrimp in the Gulf of Mexico and South Atlantic Regions

Real (i.e., adjusted for inflation) prices for both regions exhibited similar trends (Figure 2-4). Real prices were computed using the Producer Price Index (PPI) for all commodities, with 1982 as the base year (U.S. Department of Labor, Bureau of Labor Statistics, 2003). The index for each year (t) was computed using the following expression; Nominal $Price_{year\ t}$ * (100 / $PPI_{year\ t}$). Real prices were also computed (though not shown graphically in this report) using the implicit price deflator for Personal Consumption Expenditures as reported by the U.S. Department of Commerce, Bureau of Economic Analysis (1996 = base year). A similar trend was observed, though the magnitude of the real prices changed. Note that the PPI-deflated price series both exhibit a generally declining trend. Real prices for the Gulf of Mexico and South Atlantic regions in 1982 were $2.08 and $2.80, respectively. With some fluctuations, real prices declined to $1.49 and $1.73 in 2001 for the Gulf of Mexico and South Atlantic regions, respectively.

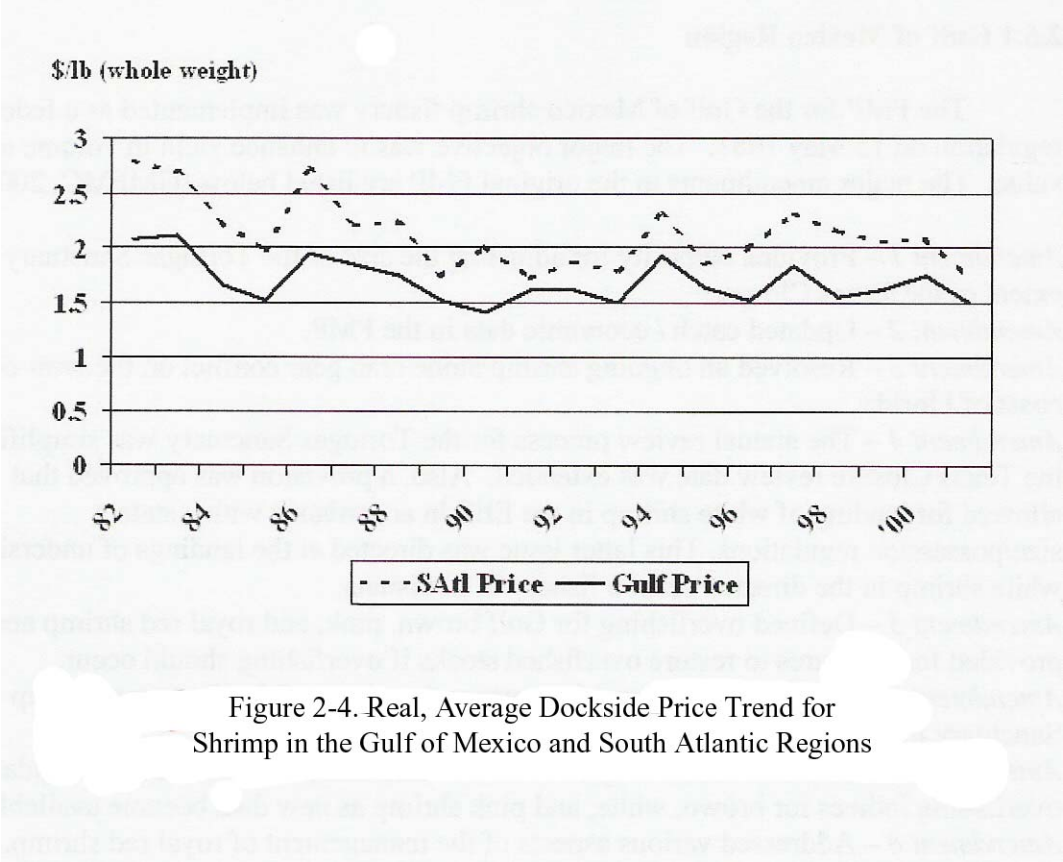

Figure 2-4. Real, Average Dockside Price Trend for Shrimp in the Gulf of Mexico and South Atlantic Regions

2.6 Management History

The management of the shrimp fishery in the Gulf of Mexico and South Atlantic regions is complex. Each state in the region has jurisdiction over state waters. Management in the federal waters zone is conducted under the auspices of the federal fishery management council structure. Specifically, the shrimp fishery in the Gulf of Mexico region is managed via the Gulf of Mexico Fishery Management Council. The shrimp fishery in the South Atlantic region is managed by the South Atlantic Fishery Management Council. Each regional council manages the fisheries under its jurisdiction with respect to the issues which characterize the fishery within the respective region, though some issues of common interest between the two regions exist. Management is conducted via Fishery Management Plans (FMPs) that exist for shrimp in each region. Changes in each FMP are accomplished through an FMP amendment process. The following discussion provides a brief overview of the FMP amendments approved for the shrimp fisheries in each region.

2.6.1 Gulf of Mexico Region

The FMP for the Gulf of Mexico shrimp fishery was implemented as a federal regulation on 15 May 1981. The major objective was to enhance yield in volume and value. The major amendments to the original FMP are listed below (GMFMC, 2002).

Amendment 1 – Provided authority for adjusting the size of the Tortugas Sanctuary or the extent of the Texas Closure.
Amendment 2 – Updated catch / economic data in the FMP.
Amendment 3 – Resolved an ongoing shrimp/stone crab gear conflict on the west-central coast of Florida
Amendment 4 – The annual review process for the Tortugas Sanctuary was simplified and the Texas Closure review date was extended. Also, a provision was approved that allowed for landing of white shrimp in the EEZ in accordance with a state's size/possession regulations. This latter issue was directed at the landings of undersized white shrimp in the directed seabob fishery in Louisiana.
Amendment 5 – Defined overfishing for Gulf brown, pink, and royal red shrimp and provided for measures to restore overfished stocks if overfishing should occur.
Amendment 6 – Eliminated the annual reports and reviews of the Tortugas Shrimp Sanctuary in favor of monitoring and an annual stock assessment.
Amendment 7 – Defined overfishing for white shrimp and provided for future updating of overfishing indices for brown, white, and pink shrimp as new data become available.
Amendment 8 – Addressed various aspects of the management of royal red shrimp.
Amendment 9 – Required the use of an NMFS bycatch reduction device in shrimp trawls used in the EEZ.
Amendment 10 – Proposed to require the installation of an NMFS-certified BRD that reduces the bycatch of finfish. The amendment also proposed utilizing existing trawl surveys to determine annual bycatch estimates.

Amendment 11 – Required all commercial shrimp vessels and boats that harvest shrimp in the Gulf of Mexico exclusive EEZ to obtain a renewable federal permit. Also, the use of traps in the royal red fishery was proposed to be prohibited.
Amendment 13 – Added rock shrimp to the Gulf of Mexico Shrimp FMP.
Other Actions – Established a control date of 6 December 2003 for the commercial shrimp fishery operating in the Gulf of Mexico EEZ. This control date may be used as a qualifying criterion for participation in the fishery with respect to future management measures.

2.6.2 South Atlantic Region

The FMP for the South Atlantic shrimp fishery was implemented as a federal regulation in December 1993. The major initial objective was to allow closure of EEZ waters adjacent to each state to protect white shrimp stocks from excessive mortality during periods of severe cold weather. The major amendments to the original FMP are listed below (SAFMC, 2002).

Amendment 1 – Added rock shrimp to the management unit, prohibited rock shrimp trawling in areas of critical Oculina coral habitat, and requested permits for all captains, vessels, and dealers in the fishery.
Amendment 2 – Addressed issues related to brown and pink shrimp, required the use of BRDs in all trawls used within the EEZ, and established a BRD certification process.
Amendment 3 – Addressed habitat requirements of the Magnuson-Stevens Act with respect to rock shrimp.
Amendment 4 – Addressed Sustainable Fisheries Act requirements concerning the rock shrimp fishery, including amending data reporting requirements to comply with the Atlantic Coastal Cooperative Statistics Program, and adding information on fishing communities.
Amendment 5 – Proposed several actions pertaining to rock shrimp, including establishing a limited access program, requiring captains of permitted vessels to have a vessel operator's permit, restricting the minimum mesh size, and requiring permitted vessels to install and use a Vessel Monitoring System.
Amendment 6 – Proposes to address Sustainable Fisheries Act Criteria (MSY, OY, overfishing levels, etc.) and potential modification to the Bycatch Reduction Device (BRD) Protocol with respect to rock shrimp.

2.6.3 Policy-related Changes

In addition to regulatory changes imposed on the industry through the fishery management plan process, other policy changes have impacted the manner in which shrimp vessels conduct their operations in the GSA region. For example, the Endangered Species Act of 1973 lists many species of sea turtles as either endangered or threatened. Sea turtles are sometimes caught in shrimp trawls during the trawling process. As a result, the National Marine Fisheries Service passed a final ruling in 1987 that required shrimp vessels to utilize turtle excluder devices (TEDs) beginning in 1988. In addition, certain species of finfish inhabit the same types of bottom habitat preferred by shrimp.

These finfish, particularly juvenile red snapper, are often caught in shrimp trawls. The mortality associated with such non-targeted harvest has been shown to be an important component of overall red snapper fishing mortality. As a result, Amendment 9 to the GMFMC Shrimp Plan (implemented in 1997) required the use of bycatch reduction devices in shrimp trawls as a means to reduce the mortality of juvenile red snapper and other species of finfish of economic importance.

Although reportedly successful in reducing the turtle and finfish mortality associated with shrimp trawls, the rulings have imposed additional costs on shrimp vessels. These costs are associated with the initial investment of TEDs and BRDs, the additional fuel costs associated with pulling TEDs in trawls, and the costs associated with shrimp loss through TEDs and BRDs. These costs will be discussed within the context of the overall financial situation confronting vessel operations in the next section.

2.7 Vessel Operating Expenses

The costs associated with operating a commercial shrimp vessel in the GSA region have increased in recent years. Key causes include higher fuel prices, more costly insurance, and costs associated with utilizing TEDs and BRDs. Haby, et al. (2000) finds that between 1986 and 1997, the total expenses associated with operating a commercial trawler in the Gulf of Mexico ranged from $0.83 to $1.19 per dollar of gross revenue. Over the period of the study, a cost of $0.98 was incurred by the median trawler sampled to generate $1.00 of gross revenue. Major costs included crew shares, fuel, and repairs to vessel and gear, with little ability to pass these costs in the form of higher dockside prices to the first handler of the shrimp.

Rising fuel costs and escalating insurance premiums for vessels are two of the most recent and episodic increases in vessel operating costs. Ward, Ozuna, and Griffin (1995) found, in a costs and earnings study, that fuel, maintenance, and insurance were the three largest cost items confronting vessel operators in the Gulf of Mexico. Fuel cost and insurance accounted for 42% of the total vessel operating cost. Maintenance costs accounted for an additional 22% of the total. Thus, any increases in these major cost categories will place additional financial burdens on the business of operating a shrimp vessel, particularly given the extremely slim profit margin found by Haby, et al. (2000). However, Vondruska (2003) has shown that, in general, fuel costs have been increasing through 2002.

Additional sources of cost increases for commercial shrimp trawlers are linked to compliance with changes in recent fisheries regulations. Provisions in the Endangered Species Act require all shrimp vessels in the GSA region to have a turtle excluder device (TED) placed in the trawl throat. This device is designed to reduce the likelihood that endangered sea turtles will get caught and drown in the net while trawling. A similar device, referred to as a bycatch reduction device (BRD), is now required to be built into the shrimp trawl to allow undersized finfish (such as red snapper and other economically important species) to escape the shrimp trawl. The use of these devices, though required by federal law, results in increased operational costs. For example, each of these devices

incorporated into a shrimp trawl represents an investment cost. The devices also contribute to increased operating costs because a certain amount of shrimp escape through the device openings (Griffin and Oliver, 1991; Wui, R.S., et al., 2001). This loss in shrimp represents a direct revenue loss, or an additional trip cost, to the vessel. Thus, individual shrimp vessels must by law incur the costs associated with species protection measures and other regulatory constraints, with little ability to influence market price in a manner that might compensate for these costs. In summary, vessel operators are recognized as price takers who are unable to recover various forms of increased operational costs by influencing selling prices for their shrimp at the docks.

2.8 Recent Changes Culminating in the Domestic Shrimp Market

The domestic market for warm-water shrimp in the U.S. has undergone significant changes in recent years. Demand for shrimp is at an all-time high. The U.S. supply of shrimp has evolved such that an increasing share is being derived from foreign sources. These foreign sources are themselves becoming more dependent on cultured, rather than trawled, shrimp. The technology of culturing shrimp in coastal and inland impoundments has become standardized in many regions of the world. The costs associated with the culture process allow shrimp to be produced and shipped to U.S. markets at price levels and volumes which have purportedly exerted strong downward pressure on domestic dockside prices. This downward pressure on dockside prices, along with high operational costs of domestic shrimp vessels (i.e., the recent increase in diesel fuel prices), has created a "cost / price squeeze" for many domestic vessels that compromise the financial viability of the commercial shrimp fleet in the GSA region. The eroded profit margin for vessel operators has resulted in a recent reduction or cessation of trawling operations for many vessels throughout the region.

In an effort to alleviate the current fleet-level crisis, representatives of the shrimp-harvesting sector, including the recently organized Southern Shrimp Alliance, have begun exploring means by which the dockside price of shrimp can be supported, including the use of import controls. Such controls on shrimp import volumes would theoretically have the effect of boosting dockside prices in the near term. Though fleet operators would favor such quantity controls, other participants in the market may not view such restrictions as beneficial. For example, processors may wish to maintain a steady and consistently high-volume, import-augmented throughput to keep average costs down. Similarly, consumers' recent, unprecedented demand for shrimp would likely favor any situation that would produce high volumes of low-priced shrimp, as long as product quality is not compromised. Murray (2003) suggests that the economic impact from imported shrimp approaches $9 billion in economic output and contributes 138,000 jobs.

The domestic price received by shrimp vessels has been subject to considerable downward pressure from increasing supplies of imported shrimp. Many size classes of shrimp exist. And some states specialize in the production of certain size classes. For example, Louisiana's catch is dominated by smaller size shrimp, which are targeted by the many smaller, inshore shrimp vessels which characterize that state's shrimp fleet. In contrast, the Texas shrimp fleet is characterized by larger vessels which fish farther

offshore for larger, more valuable shrimp. In fact, Texas has implemented since 1981 a management program that closes the offshore waters to shrimping for a 2-month period, with the purpose of letting shrimp grow to a more valuable size prior to harvest. Regardless of the size class of shrimp, average prices at the dock have generally been trending downward during the past several years. For example, real ex-vessel (dockside) prices (adjusted for inflation using a CPI deflator index to 1982 as the base year) for shrimp landed by offshore vessels in Texas have declined from $4.57 in 1979 to $2.47 in 2001 per pound of heads-off tails (Haby, et al., 2002) (Figure 2-5). These prices represent a weighted average of the multitude of size classes of shrimp that are caught by the Texas offshore fleet. Prices exhibited a rebound during 1994 ($3.44) and 1997 ($3.52), but then declined to unprecedented lows in 1998 and 2001.

A current industry perception is that the nominal prices for certain size classes of imported shrimp are below the nominal domestic ex-vessel prices for the same size class of shrimp. Although this may be the case, no formal empirical studies have revealed this relationship. However, the existence of a falling domestic price provides evidence that import volumes are placing downward pressure on domestic ex-vessel prices. A comparison between the nominal ex-vessel price of heads-off tail (weighted across all size classes) from Texas offshore trawlers and Thailand-cultured imports further strengthens this argument. For example, Texas and Thai shrimp tails were nominally valued at approximately the same amount during 1997 ($5.21 and $5.37, respectively) and exhibited similar trends until 2001, with ex-vessel prices being below import, tail-meat prices (1999 being an exception in both cases) (Figure 2-6).[1] At the time of this writing, domestic ex-vessel prices were not available for 2002, but personal communications with several industry representatives suggest that domestic trawl prices in 2002 and 2003 continued the downward trend begun in 2000.

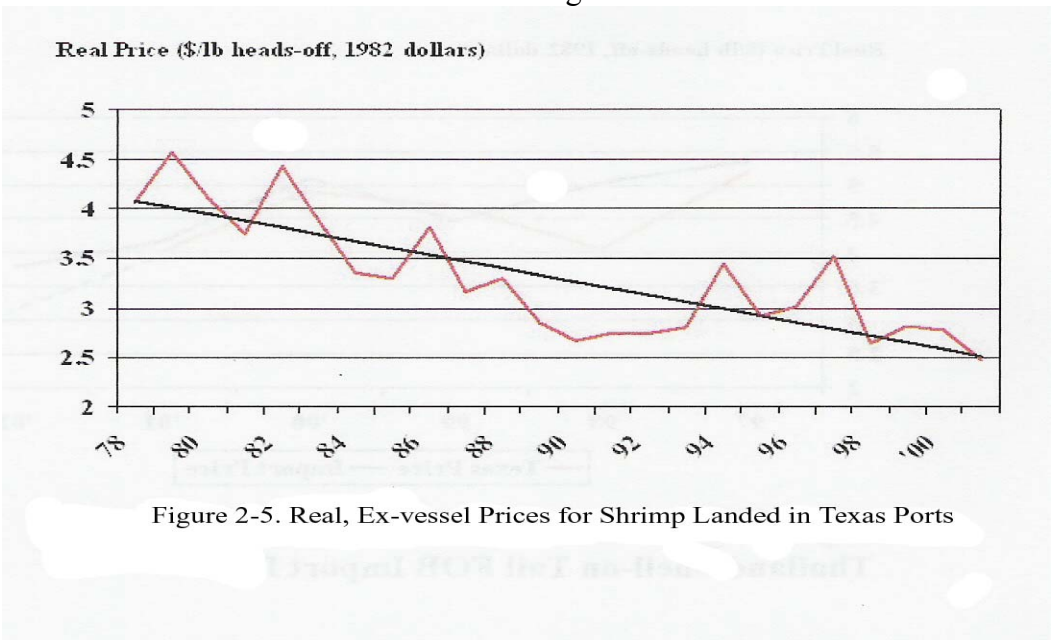

Figure 2-5. Real, Ex-vessel Prices for Shrimp Landed in Texas Ports

[1] Texas price data were taken from Haby, et al., 2002, while the Thai price data were obtained from the NMFS international trade data website.

Declining real and nominal prices, along with increasing costs of operation, have created difficulties in maintaining financial solvency for commercial shrimp vessels in the GSA region. This phenomenon was the primary motivation behind the recent successful Texas Shrimp Summit, which provided a forum for U.S. and Mexican vessel/fleet operators and shrimp processors to discuss this complex issue. As pointed out at the Summit, cost increases associated with fuel use may be difficult to control, given that most businesses who are not bulk purchasers of fuel exert no influence on the per-unit cost of fuel utilized. Thus, reducing fuel costs, as well as most other operating costs, per unit of effort may not be a viable strategy for the industry in the near term. However, some merit may be placed in developing strategies for placing upward pressure on market and, thus, dockside prices. Given the recent influx of shrimp industry relief funds provided by NOAA, discussions by the industry regarding the use of a portion of these funds for market assistance are ongoing. Developing a strategy to enhance the

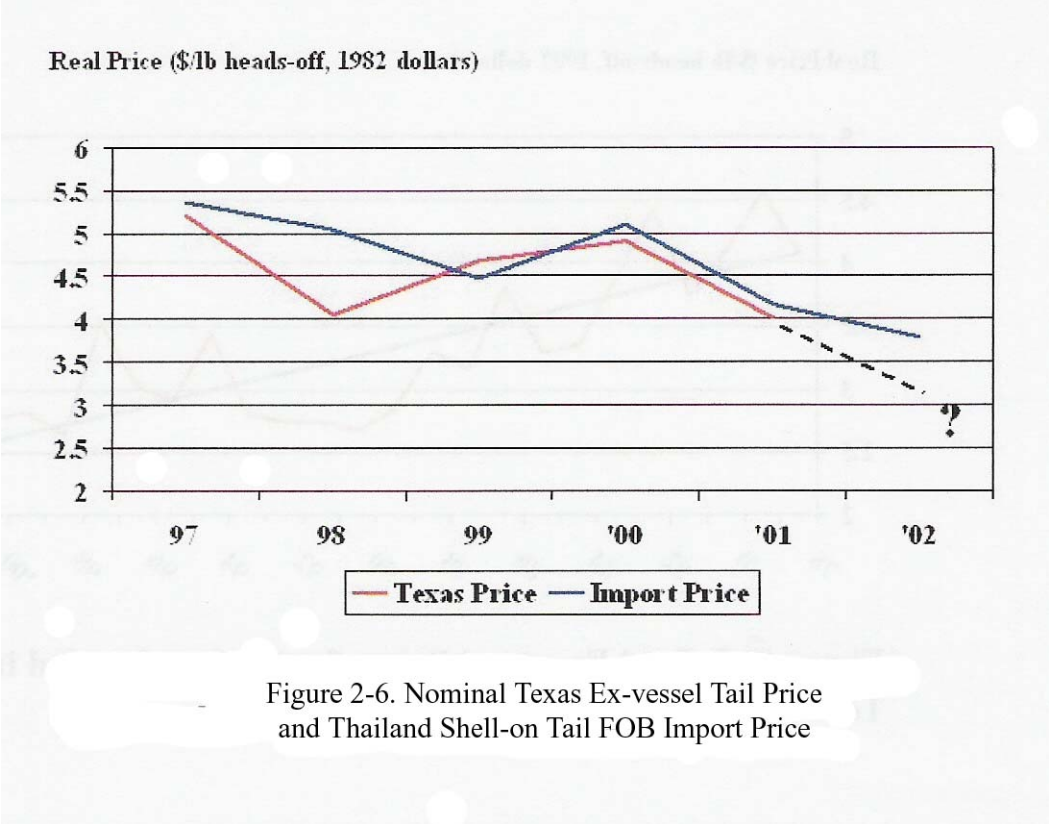

Figure 2-6. Nominal Texas Ex-vessel Tail Price and Thailand Shell-on Tail FOB Import Price

market for shrimp landed in the GSA region is receiving much attention. The success of such a program will obviously depend upon the willingness of consumers to pay a premium price for a domestically produced shrimp as opposed to an imported shrimp. Attributes such as freshness, flavor, and more will need to be highlighted to distinguish domestic shrimp in a market that is currently dominated by imported product. The success of such a program to the industry will be measured by the price response on the dock.

Will price increases result in a fleet response? Will a successful marketing program result in new entry into the fleet, thereby possibly dissipating rents across the new entrants as was done in the 1970s and 1980s. Or, is the lack of support services, such as insurance and financing, a sufficient barrier to significant new fleet entry? If not, will an access or effort limitation program for the GSA shrimp industry, other than the existing permit system and control date, be warranted? These issues may need to be addressed prior to implementation of such a market development program to ensure the highest payoff for limited market development funds.